TACSATCOM 1968-69

Photo of TACSAT display at the Air Force Museum at Wright-Patterson Air Force Base, Dayton Ohio (Steve F. Russell, 2001).

DEPARTMENT OF DEFENSE EXPERIMENTAL TACTICAL COMMUNICATIONS SATELLITE (TACSAT I)

TACSAT I was part of an overall Department of Defense (DoD) program designed to see if satellite communication repeaters could be used with mobile communications equipment on land, sea, and air. TACSAT I [the satellite segment] was launched on February 9, 1969, by an Air Force Titan III-C, into a near-synchronous equatorial orbit at approximately 19,300 miles altitude. At the time of its launch, it was the free world's largest experimental communication satellite. It could relay television signals or multiple telephone or teletype communications. On July 20, 1969, TACSAT I previewed the future of military and civilian communications when it relayed live television coverage of the Apollo 11 moon landing to Alaskan television stations. It gave Alaska the first live television coverage of any national event.

The full-size TACSAT I was approximately nine feet in diameter and 24 feet in height, and weighed about 1,800 lbs. To generate electrical power, the main lower body of the satellite was almost completely covered by 60,000 solar cells.

The program manager for the TACSAT was the Air Force Systems Command's Space and Missile Systems Organization [SAMSO in Los Angles] (since renamed Space Systems Division). The prime contractor was Hughes Aircraft Company.

In 1968 I was a 24 year-old electrical engineer and working at Collins Radio Company in Cedar Rapids, Iowa, when I was tasked with the design and development of the preselector filters and low-noise preamplifiers that would go into both the satellite and the ground based units. TACSATCOM was the name we used for the TACSAT I military tactical satellite program. The performance specifications for this equipment were so difficult that I had to pioneer the design and development of an entirely new concept in manufacturable, 3-stage UHF preselector filters using helical resonator elements. This was the first time these theoretical elements were applied to practical equipment design. A 2N4957 bipolar transistor was used to achieve the very low-noise requirements. The project was military classified at the time and no publicity, papers, or patents were possible. Even today, I have been unable to find any documents on the internet. Collins Radio was a subcontractor to Hughes Aircraft Company and was responsible for development and manufacture of the electronic communications equipment.

Over the years I asked many US Air Force people about TACSATCOM but received essentially no information. This museum display was the first verification that such a program had ever existed. It was not a dream!

Steve F. Russell